

A need therefore exists for an improved means of providing contact-less power transfer between two devices coupled with an integrated bi-directional communication link, and consuming minimal amount of energy.

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CLAIMS

What is claimed is:

10 1. Apparatus for contact-less communications system comprising:

15 a separable transformer means including a primary upstream transformer half and a secondary upstream transformer half adapted for magnetic coupling, at least one of said halves having a core of ferrite material for operating at a frequency of at least five (5) to ten (10) times the maximum upstream bit rate;

20 a power supply circuit connected to the said secondary upstream transformer half including a rectifying means for creating a constant DC voltage from the alternating voltage induced in the secondary upstream transformer half by the primary upstream transformer half;

a clock recovery circuit connected to the said secondary upstream transformer half;

25 an amplitude modulation means to induce the upstream data in the primary upstream transformer half, said data being sent through the inductive link set up by the primary and secondary upstream transformer halves;

30 a data recovery circuit connected to the said secondary upstream transformer half; including an amplitude demodulation means for receiving the upstream data sent via the inductive link set up by the primary and secondary upstream transformer halves.

a second contact-less communications means to provide the downstream data link;

2. Apparatus for contact-less communications system as per claim 1, where the contact-less downstream data link is implemented as a second inductive link

an amplitude modulation means to induce the downstream data in the primary downstream transformer half, said data being sent through the inductive link set up by the primary and secondary downstream transformer halves;

a data recovery circuit connected to the said secondary downstream transformer half; including an amplitude demodulation means for receiving the downstream data sent via the inductive link set up by the primary and secondary downstream transformer halves.

3. Apparatus for contact-less communications system as per claim 1, where the contact-less downstream data link is implemented as a second inductive link

a phase modulation means with input connected to the said secondary upstream transformer half, with output connected to the said primary downstream transformer half;

a downstream data recovery circuit including a phase demodulator means connected to the secondary downstream transformer half;

4. Apparatus for contact-less communications system as per claim 3, where the contact-less downstream data link is implemented as a second inductive link

a phase modulation means including a switch with input connected to the said secondary upstream transformer half, with output connected to the said primary downstream transformer half and with switching control driven by the downstream data in order to alter the phase of its input;

a downstream data recovery circuit including a phase comparator means connected to the said primary upstream transformer half and to the said secondary downstream data half;

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5. Apparatus for contact-less communications system as per claim 1, where the downstream data link is implemented as an optical link;

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an amplitude modulation means including an infrared diode to transmit the downstream data;

a downstream data recovery circuit including an infrared photo diode to receive the downstream data;

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6. Apparatus for contact-less communications system as per claim 1, where the downstream data link is implemented as an optical link;

an amplitude modulation means including a light emitting diode to transmit the downstream data;

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a downstream data recovery circuit including a light emitting photo diode to receive the downstream data;

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FIELD OF THE INVENTION

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This invention relates to an apparatus for transferring electrical power, and more specifically to a magnetic power connector for transferring power without electrically conductive contact. In addition it relates to an apparatus for establishing data communication, and more specifically to a synchronization and representation (modulation) of the data sent over the said data link.